The 1950s

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1945-1959: PEACE AND COLD WAR

When World War II ended in September 1945, scientists in the United States were regarded with respect and awe for the seeming miracles—penicillin, radar, the just-revealed atomic bomb—that transformed civilization. Senior scientists and engineers who had managed wartime research called for a new agency to make federal patronage of research permanent. The Truman Administration agreed that the United States needed new knowledge to meet the mortal challenge of the new Cold War.

But the hoped-for single science agency never developed. By the time the National Science Foundation (NSF) came into being with the first National Science Board meeting in December 1950, the government had other important research sponsors, notably the Atomic Energy Commission (AEC) and the Office of Naval Research (ONR). In the 1950s, the Foundation grew cautiously in the shadow of larger research agencies; Board and Director sidestepped the national policy role assigned to them by law. By 1957, when the Sputnik crisis convinced Americans that the Soviets were winning the Cold War, the Foundation had gained enough stature to warrant a major expansion.

The Debate of 1945-1950

Vannevar Bush was a leading inventor and engineer. At the outset of World War II, he obtained the strong backing of President Franklin D. Roosevelt to harness the Nation's scientific resources. As head of the Office of Scientific Research and Development (OSRD), he organized hundreds of research projects in university and industrial laboratories. By war's end, Bush was one of the most famous scientists in the Nation. An April 3, 1944 cover story in *Time* magazine called him the "General of Physics." When peace came in the summer of 1945, the "general" was marshaling his troops on another front—the creation of a peacetime government agency that would replicate OSRD's success.

During the war, Bush had convinced Roosevelt that the most efficient way to use the Nation's best university researchers was to keep them on their campuses and fund them from Washington. Historically, American science was undertaken in private laboratories and self-supporting universities—in 1930 universities performed $20 million worth of privately funded research (equal to about $170 million in today's currency). But OSRD brought enormous federal support to the table. By 1943, it had awarded $90 million in university research grants.

In 1944, Roosevelt asked Bush to prepare a report on postwar arrangements for science. Bush convened four committees of leading figures, including James Conant, president of Harvard; Lee DuBridge, who ran the wartime Massachusetts Institute of Technology (MIT) lab that developed radar; Isaiah Bowman, president of

1950

1950 President signs bill creating National Science Foundation

1950 National Science Board's first meeting

NSB Chair Conant

Johns Hopkins University; Henry Allen Moe of the Guggenheim Memorial Foundation; and leaders from medical schools and private foundations. When the report was ready in May 1945, Roosevelt had died and the new president, Harry S. Truman, received it.

Science—The Endless Frontier was a manifesto for government to provide regular funding for university basic research and the education of future scientists through a single new agency. But the report stated strongly that to protect it from undue political influence, the novel enterprise had to be managed by scientists themselves. The report proposed a national research foundation run by a board of "nine Members, who should be persons not otherwise connected with the Government."

Truman thanked Bush and allowed *Science—The Endless Frontier* to be released without comment. Immediately, Bush arranged for Senator Warren Magnuson (D-WA) to introduce a bill that would implement the report. But in fact, the President did not agree with the plan. He wanted the central science agency to have a single Director answerable to him. As Harold D. Smith, director of the Bureau of the Budget (BOB), said in hearings, "An agency which is to control the spending of public funds in a great national program must be part of the regular machinery of government."

Bush and his colleagues, including Bowman, took issue with Truman. Claiming to represent the voice of American science, they gathered thousands of signatures and published their letter to Truman in the *New York Times*. The group argued that if control was in the hands of a single, politically appointed Director, he would be unable to win over the best universities, nor guide them wisely. When a bill to create a Board-controlled Foundation passed Congress in 1947, Truman vetoed it.

The fight over competing visions of who should control the new agency dragged on. Another issue was the Foundation's national policy role. The Truman White House and Bureau of the Budget wanted the Foundation to evaluate other agency research programs and make national science policy. A report by Truman aide John Steelman in 1947, which surveyed research and development (R&D) across government, supported Truman's case. But the fast-growing AEC, ONR, and National Institutes of Health (NIH) arranged for their Congressional patrons to minimize the proposed new agency's role in prospective bills.

The compromise bill that finally passed in 1950 stated that "the Foundation shall consist of a National Science Board…and a Director," both appointed by the President to six-year terms. Truman and BOB got a Director; Bush and his colleagues got a governing Board of twenty-four-members who "shall be eminent in the fields of the basic sciences"…and "selected solely on the basis of established records of distinguished service." The Board members, and not the President, would elect the Board's Chair.

1951 McClintock presents evidence of transposable genetic elements (Nobel 1983)

1951

The Foundation was to evaluate and correlate federal research programs and "develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences." On May 10, 1950, at a train stop in Pocatello, Idaho, President Truman announced he had signed a new law, P.L. 81-507, that "established in the executive branch of government an independent agency to be known as the National Science Foundation."

Activating the Board and Foundation

The Foundation was conceived, but not yet born. On June 25, 1950, North Korean forces attacked South Korea and troops mobilized under United Nations Commander General Douglas MacArthur were ordered to push them back. Truman declared the North Korean aggression a Communist strategy to undermine "the free world." In the press of emergency appropriations, the House hacked to zero the $450,000 the Administration had requested for the new science agency. DuBridge wrote to Steelman: "Would the possibility of reinstatement [be] increased if the President should promptly announce the creation of the National Science Board and the activation of this important new agency?"

Promptly following DuBridge's letter, the National Academy of Sciences, as allowed by the NSF Act, gave the White House a list of those it thought qualified for the Board. On September 30, 1950, Truman signed letters of invitation to some of the men on the NAS list, but also to others suggested by Steelman, among them two women, two African American academics, and two members of the Catholic clergy. Later, Congress decided on a budget of $225,000 for the Foundation through June 1951.

A Political Director?

It was an imposing group that gathered at the White House on December 12, 1950. Though President Truman had not yet arrived, Steelman opened the meeting. Board members elected Conant as chairman and Charles Dollard of Carnegie Corporation of New York as vice chairman. The NSF Act mandated an executive committee, of which Detlev W. Bronk was elected chairman. Bronk, a biologist, was president of Johns Hopkins University and of the National Academy of Sciences.

Members at this first meeting had heard rumors that Truman had offered the post of the Foundation's Director to someone they considered less than qualified for the job: Frank P. Graham, a lame-duck U.S. Senator and former history professor. According to later accounts, Truman showed up and asked what they had been talking about. Someone replied that they'd been wondering what qualifications Truman thought were appropriate for the Foundation's Director.

"Financial support for research serves a double purpose: Acquisition of scientific knowledge and development of scientists."

Chester I. Barnard, Board Chair (1951-1955)

Truman answered, "There's only one criterion. He must get along with me." Thus continued the tension of how much the White House would control a Foundation explicitly endowed by Congress with its own independent governing Board.

By law, the President was required to seek the Board's advice before making a formal nomination. Board protests eventually caused Graham to withdraw from consideration. At the Board's fourth meeting in March 1951, a telegram from Truman announced he would nominate Alan T. Waterman, former Yale physicist and chief scientist of the ONR, as Director. Waterman had been on the Board's list of candidates for Director, and his nomination was greeted "with audible relief" by the members.

A Science Advisor for the President, a Defense Role for NSF?

Just as contentious as the matter of who should serve as the Foundation's Director was the question of whether there was a need for a White House science advisor. Early in the Board's tenure, Wall Street banker William T. Golden became President Truman's consultant on the question of how to mount another major research effort if the Korean hostilities accelerated into a third world war. In late 1950 and early 1951, Golden discussed with scientific leaders in and out of government, including the Board, the idea that the President should have a science advisor.

At its second meeting on January 3, 1951, the Board opposed Golden's notion of a science advisor because that job would entail national policy advice as well as the coordination of government research, including defense research—responsibilities the NSF Act had granted to the Foundation. Ironically, Board Chair Conant did not think the tiny Foundation should activate its defense role, but "things just snowballed" at the meeting because Executive Committee Chairman Bronk, whom Board members overwhelmingly supported for the Director's job, said he would not consider the position if the Foundation did not exercise its full powers. Thus, in order to keep Bronk a candidate for Director, the Board went on record opposing the science advisor plan.

Soon afterwards, Bronk met with the trustees of Johns Hopkins, who doubted he could be president of NAS, director of the new Foundation, and president of their university all at once. Bronk took himself out of the running for Director. The science advisor question would arise again later, but for the moment the Board, at its third meeting in February 1951, took the opportunity to issue a statement that the Foundation would not, after all, activate its defense role.

1953 Watson and Crick determine double helical structure of DNA (Nobel 1962)

1953

NSB Chair Barnard

NSF Director Waterman

Setting the Terms for Academic Science

The early Board set up committees corresponding to the eventual divisions of the yet-to-be staffed Foundation. The Board tried to organize graduate fellowships for scientific study or scientific work, but the initial year's budget was too small. The first fellowships were not awarded until 1952.

When Waterman became Director, he decided the Foundation would operate as had ONR by awarding grants instead of contracts. Grants gave investigators more freedom and were less cumbersome to administer. They also implied trust and lessened the impression of government control. In addition, Waterman decided that staff would use outside panels to advise NSF about which proposals to fund.

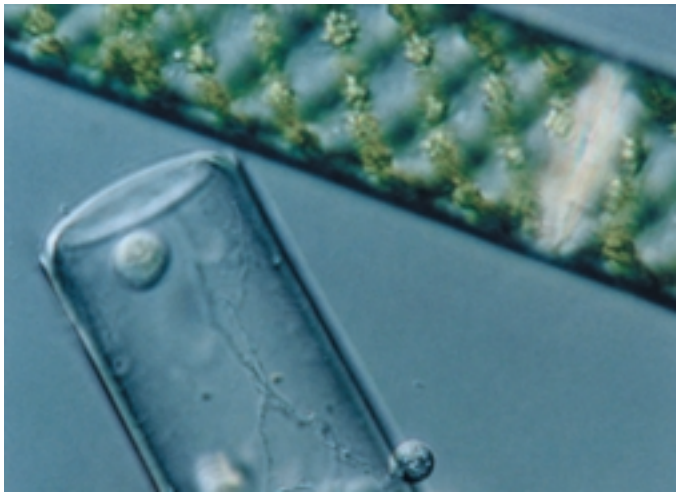
Following a format used by the Rockefeller Foundation, Waterman and the staff presented the Board with a slate of grants to award—all in biology, as it happened—on February 1, 1952. Board member James A. Reyniers wrote a letter to Bronk, saying that "some Board members were not at all pleased by the 'rubber stamp' manner in which the 'docket' of grants was presented to it for approval." He went on to complain that the incident was indicative of NSB's "growing isolation from the operation of the agency."

Board members went into executive session and afterwards, their qualms allayed, approved the slate. Communications between Waterman and the Board remained cordial and productive through this and other twists along the path to a fully functioning Foundation. Waterman made a concerted effort to engage the Board at a level of decision making that would still allow him to manage Foundation affairs from day to day. But it was clear that a key decision point had been passed: the Foundation would be largely staff-run.

Historian J. Merton England notes how much the choice of Waterman as the Foundation's first Director shaped the agency—right down to the multiple-choice rating system for the scientific quality of proposals (from "excellent" to "poor") that remained in use for decades. Besides influencing the procedures and values of Foundation staff, Waterman left another legacy: close and considerate working relations between the Director and the Board.

Defending Political Freedoms

The White House and BOB, as during the debate of 1945-1950, wanted the Foundation to exercise a national policy role. However, both Waterman and the Board worked to avoid becoming a central coordinator and evaluator of federal R&D programs. Compared to other federal agencies such as the AEC and NIH, the Foundation's resources were miniscule. Taking possibly controversial stands on other agencies' programs could make NSF vulnerable to retaliation.



Martha J. Powell/University of Alabama

1954

1954 Supreme Court in Brown v. Board of Education declares segregated schools illegal

1954 First human organ transplant

1954 Salk develops [introduces] vaccine against polio

NSB Chair Barnard

NSF Director Waterman